

driven clips and idler clips, with at least one idler clip between respective pairs of driven clips, the improvement comprising:

a) heating the vinyl polymer film to a sufficiently high temperature to allow a significant amount of stretching without breaking; and

b) imparting a machine direction cooling gradient to at least a portion of the width of the stretched film in an effective amount to improve the uniformity of spacing of the driven and idler clips.

Remarks

Claims 1-11, 13-18, 20-42, 44-48 and 71-90 remain in this application. Claims 20 and 81 have been amended. No new matter has been added. Replacement pages reflecting the changes to the claims are attached in accordance with 37 C.F.R. §1.121. To facilitate the understanding of this response, Applicants have set forth Applicants' arguments in specific headed paragraphs. Favorable reconsideration of this application as amended is requested.

Election/Restrictions

Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (M.P.E.P. 818.03(a)).

Claims 12, 19, 36, 43, 49-70 are withdrawn from further consideration pursuant to 37 C.F.R. 1.142(b) as being drawn to non-elected species, there being no allowable generic or linking claim. Election was made without traverse in Paper No. 8.

Applicants acknowledge that the above-referenced claims have been withdrawn from consideration as being drawn to non-elected species and Applicants will cancel such claims should a generic or linking claim not be allowed. However, Applicants would expect that the claims would be reinstated should the Examiner hold a generic or linking claim(s) to be allowable.

Rejection under 37 C.F.R. § 1.112, second paragraph

Claim 17, 18, 20-25, 41, 42, 44-48 and 81-90 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The Examiner states that claims 17, 41 and 81 recite that the film comprises a vinyl polymer. Claims 20, 44 and 87, which are dependent on these claims, recite that the film comprises polypropylene. The Examiner states correctly that Applicants claim the polypropylene as a species of the vinyl polymer genus. The Examiner further states that one of skill in the art would not recognize polypropylene as a vinyl polymer and therefore the claims are indefinite.

Applicants respectfully draw the Examiner's attention to the Polymer Science Dictionary, 2nd ed., Mark Alger, ed. (Chapman & Hall, 1997) at page 604-05 (a copy of which is enclosed). Wherein it states under the term "vinyl polymer" at page 605, column 1, 2nd full paragraph, "Important polymers are the polyolefins, e.g. polyethylene (X=H), polypropylene (X=CH₃),"

Applicants respectfully submit that based on the above-identified definition taken from the Polymer Science Dictionary, a volume that would be understood by those skilled in the art, the claims are not indefinite and the Applicants can correctly claim polypropylene as a vinyl polymer. Applicants ask the Examiner to withdraw all such rejections based on clarity regarding polypropylene.

Applicants have amended claim 20 to correctly depend from claim 18. Applicants apologize for the typographical error.

Claim Rejections under 35 U.S.C. § 103

Claims 1-4, 6-11, 13-18, 20-24, 26, 28-30, 32-35, 37-42, 44-47, 71, 73-79, 81 and 83-89 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 3,551,546 (Gosper et al.) in view of U.S. Patent No. 4,853,602 (Hommes et al.).

The Examiner has rejected all of the pending claims for various reasons over Gosper et al. in view of Hommes et al. To reduce some of the complexity, Applicants will address rejection of the four independent claims 1, 26, 71 and 81. Since all of the other claims are dependent from one of these four claims, Applicants suggest that the dependant claims will be allowable provided the independent claims are allowable.

The Examiner has stated that Gosper et al. teach the basic claimed process including a method for the production of biaxially oriented polypropylene film. The Examiner goes on to state that the machine direction cooling gradient imparted to the film

in the process of Gosper et al. would inherently improve the uniformity of the spacing of the clips as claimed. The Examiner states that Gosper et al. further teach that the edges of the film should be maintained at a temperature at least below that of the intermediate film portion.

The Examiner states that Gosper et al. fails to teach that the plurality of clips include driven clips and idler clips with at least one idler clip between respective pairs of driven clips. It is stated that it would have been obvious to one of ordinary skill in the art at the time of the invention and that one of ordinary skill would have been motivated to provide idler clips between the driven clips in the process of Gosper et al. as taught by Hommes et al. to minimize film edge scalloping.

Applicants believe that Gosper et al. do not teach the basic process of the present invention. Gosper et al. teach a sequential stretching process, as opposed to the simultaneous stretching process of the present invention. Furthermore, Gosper et al. teach a sequential stretching process that is backwards to conventional sequential stretching processes.

The standard sequential stretching process requires the following steps:

1. Cast the film and quench
2. Heat web to stretch temperature
3. Stretch in the MD (machine direction – downweb) with rollers
4. After the length orientation (step 3) – grip with clips
5. Run the length oriented film into an oven to heat it up and once heated, cause the rails (the clips are attached to rails) to diverge, thereby stretching the film in the TD (transverse direction – side-to-side of the web).
6. The rails then run parallel again
7. Heat set, cool down or both in some sequence
8. Release the film and roll the sequentially stretched film

The Gosper et al. process is as follows:

1. Cast the film and quench
2. Stretch in the TD with clips
3. Run the TD stretched film through a length orientor to length orient (MD orientation) the film
4. Anneal the sequentially stretched film.

In Gosper et al., in the tenter, at all times, the edges are cooler than the middle of the film. This is a temperature gradient that is transverse to the machine direction of the film. The temperature gradient taught by Applicants is along the machine direction of the film.

Applicants believe the Gosper et al. tenter, having neither idler clips nor the capability for clip-to-clip separation in the machine direction within the tenter, exhibited no idler clip lag. Applicants further believe that Gosper et al. could not even have recognized that there could be such a problem. The Examiner stated that Gosper et al. do not teach or disclose idler clips, and relies on Hommes et al. to provide the necessary teaching for such clips. Further the Examiner states that the present invention would have been obvious in view of the combined teaching. However, the process in Gosper et al. is not the basic process of the present invention as the Examiner has stated. In fact, the process is a sequential process, as opposed to a simultaneous process of the present invention. Hommes et al. provide apparatus for simultaneously stretched film, which is a different process and therefore has different hurdles to overcome. However, Hommes et al. failed to recognize that there was a problem of idler clip lag. Applicants believe that the references are not properly combined, because Applicants believe that there is no motivation to combine the references. Furthermore, the combination fails without reference to the claims of the present invention.

Applicants acknowledge that the apparatus described in Hommes et al. is similar to the apparatus used by Applicants. However, it is important to note that Hommes et al. does not recognize the less than theoretical behavior of the idler clips, therefore Hommes et al. can not address a process to overcome idler clip lag. Idler clip lag is a problem that causes different draw ratios at different locations upon the film, which in turn causes

variations in the film, including variations of film thickness and of actual physical properties of the film. In theory, the spacing between idlers clips should be $d_1 = d_2 = d_3 \dots = d_n$. In reality, as observed by Applicants on a fully operational apparatus, at most operating conditions, $d_3 > d_2 > d_1$. By controlling the down web temperature gradient such that in at least one zone, preferably chosen from the consecutive zones beginning with the first zone where stretching occurs and ending with the first zone after stretching is complete, there is imposed a cooling gradient. This cooling gradient can occur in an edge band or it can occur across the width of the film.

This is completely opposed to the process of Gosper et al. wherein any downweb temperature variation is to increase the temperature downweb except for the very last zone.

In view of the foregoing Applicants respectfully submit that the combination of Gosper et al. in view of Hommes et al. is improper. Even assuming arguedo that the combination can be maintained, Applicants submit that the art does not teach the claimed invention because the primary reference is a different process and because Applicants believe that the problem of idler clip lag was not identified as a problem and therefore, neither reference can provide an answer to that problem. Applicants believe that the claimed invention provides the answer to the problem heretofore unidentified in the art. Therefore, Applicants believe that the claims the independent claims are allowable over the art and respectfully request the Examiner withdraw all 35 U.S.C. § 103(a) rejections from such claims.

Regarding the additional rejections, the Examiner has very carefully set forth all of his reasons for rejecting the dependent claims. However, Applicants have not addressed the specifics of each rejection because the claims are dependent from the four primary independent claims, which Applicants believe are allowable over the art cited. Therefore, in view of the above arguments, Applicants respectfully request the Examiner withdraw all 35 U.S.C. § 103(a) rejections from all of the claims.

Applicants respectfully suggest this paper is fully responsive to the Office Action and the remarks and amendments have resolved the Examiner's outstanding objections and rejections. However, if after fully considering Applicants' response, there are issues

remaining, Applicants request the Examiner telephone the undersigned to timely resolve any remaining issues.

Please charge any fees that may be associated with this paper to Deposit Account No. 13-3723.

Respectfully Submitted,

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Version with markings to show amendments made:

20. (Amended) The method of claim [19] 18, wherein the film comprises polypropylene.

81. (Amended) In a method of stretching a vinyl polymer film comprising the steps of grasping the film with a plurality of clips along the opposing edges of the film and propelling the clips to thereby stretch the film, wherein the plurality of clips includes driven clips and idler clips, with at least one idler clip between respective pairs of driven clips, the improvement comprising:

a) heating the [polymeric] vinyl polymer film to a sufficiently high temperature to allow a significant amount of stretching without breaking; and

b) imparting a machine direction cooling gradient to at least a portion of the width of the stretched film in an effective amount to improve the uniformity of spacing of the driven and idler clips.

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